

What is claimed is:

1. A variable optical element comprising:

a first liquid member;

a second liquid member which is insoluble in the first liquid member;

5 a container which contains the first liquid member and the second liquid member;

an index for positioning the variable optical element according to a predetermined reference,

wherein an interfacial shape between the first liquid and the second liquid surface varies according to a voltage which is applied to the liquid members; and

10 the index is disposed such that a wave front aberration in the variable optical element should be minimum or fewer than a predetermined value under condition that the variable optical element is positioned according to the predetermined reference.

2. A variable optical element according to Claim 1 wherein:

15 the predetermined reference is disposed horizontally; and

an optical axis of the variable optical element is disposed so as to be parallel with the horizontal direction of the predetermined reference.

3. A variable optical element according to Claim 1 wherein:

20 the variable optical element and the optical element.

4. A variable optical element according to Claim 1 further comprising a frame member for supporting the container wherein the index is disposed on the frame member.

5. A variable optical element according to Claim 4 wherein shape of the frame member for supporting the container is rotationally asymmetrical around the optical axis.

6. A variable optical element according to Claim 1 wherein the variable optical element
5 is positioned according to the wave front aberration by measuring the surface of a transmitted wave.

7. A variable optical element according to Claim 1 wherein a refractive index in the first liquid is different from a refractive index in the second liquid member.

10

8. An optical unit comprising:

a variable optical element of Claim 1; and

at least an optical element,

wherein the index is disposed such that a wave front aberration in the variable

15 optical element should be minimum or fewer than a predetermined value under condition that the variable optical element is positioned according to the predetermined reference.

9. An optical unit according to Claim 8 wherein:

the predetermined reference is disposed horizontally; and

20 an optical axis of the variable optical element is disposed so as to be parallel with the horizontal direction of the predetermined reference.

10. An optical unit according to Claim 9 having an optical system which comprises:

a variable optical element of which optical characteristics varies according to

an interfacial shape between the first liquid and the second liquid according to a voltage which is applied to the liquid members; and

at least a second optical element, wherein,

the variable optical element and the second optical element can make a relative
5 rotation around the optical axis,

the index is formed by a first index which is disposed on the variable optical element and a second index which is disposed on the second optical element, and

the first index and the second index indicate a relative angle position made by the variable optical element around the optical axis which is used horizontally and the optical
10 axis.

11. An optical unit according to Claim 8 wherein the second optical element is a reflecting member.

15 12. An optical unit according to Claim 11 wherein the variable optical element is disposed so as to be near the optical axis which is returned by the reflecting member.

13. An optical unit according to Claim 12 wherein a central axis of the variable optical element is disposed so as to be approximately vertically parallel.

20

14. An optical unit according to Claim 11 wherein the reflecting member is a mirror.

15. An optical unit according to Claim 11 wherein the reflecting member is a prism.

16. An optical unit comprising:

a variable optical element of Claim 1; and

at least a second optical element, and

two frame members for supporting the variable optical element and the second

5 optical element, wherein

the indices are disposed in the frame members respectively.

17. An optical unit comprising:

a variable optical element of Claim 1; and

10 an optical system which is provided with a first group having a negative refracting force and a second group having a positive refracting force.

18. An optical unit according to Claim 17 wherein the optical system is disposed nearer the variable optical element than an object to be observed.

15

19. An image capturing device comprising:

a variable optical element of Claim 1, or an optical unit of Claim 8; and

an image capturing element.

20 20. An image capturing device according to Claim 19 further comprising:

a driving unit for driving the variable optical element; and

a power supply unit for supplying an electricity to the image capturing element and the driving unit.

21. A mobile phone comprising:

a variable optical element of Claim 1;

a displaying section;

an inputting button section;

5 a voice inputting-outputting section; and

an antenna.

22. A digital camera comprising:

a variable optical element of Claim 1:

10 a displaying section; and

an operating section.

23. An endoscope device comprising:

a variable optical element of Claim 1:

15 a light source;

a signal processing circuit; and

a power supply section.

24. Mobile terminal comprising:

20 a variable optical element of Claim 1:

a displaying section; and

a key board.